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May 14, 2013

Gary Miller, Remedial Project Manager
U.S. Environmental Protection Agency, Region 6
Superfund Division (6SF-RA)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Re: San Jacinto River Waste Pits Superfund Site
Unilateral Administrative Order (UAO), Docket No. 06-03-10, November 20, 2009
Waste Classification Issue

Dear Mr. Miller:

As we discussed in a phone call on April 30, 2013, the following provides a summary of an evaluation concerning the potential classification of sediment and/or soils containing chlorinated dibenzo-p-dioxins and furans (dioxins and furans) at the San Jacinto River Waste Pits (SJRWP) Superfund Site as Principal Threat Waste (PTW) as discussed in U.S. Environmental Protection Agency (USEPA) rules (i.e., 40 CFR § 300.430 (a)(1)(iii)) and guidance. This letter is submitted on behalf of International Paper Company (IPC) and McGinnes Industrial Maintenance Corporation (MIMC) (collectively referred to as Respondents).

The focus of the evaluation described in this letter is to determine if any source materials in the impoundments under investigation ("Impoundments"), or the area within the Preliminary Perimeter for the Site, as determined by USEPA (hereinafter referred to as the Study Area), meet National Contingency Plan (NCP) criteria for designation of PTW. As described in 40 CFR § 300.430(a)(1)(iii), PTW materials requiring treatment are either highly toxic or highly mobile and generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur (USEPA 1991). Based on USEPA

guidance, PTW materials are identified on a site-specific basis (USEPA 1997), and the following criteria are important considerations relevant to identifying PTW:

- The reasonably anticipated future land use at a site is significant in defining PTW areas. Pursuant to the NCP and the 1995 land use guidance (USEPA 1995), current land use and reasonably anticipated future land use should be considered in identifying realistic exposure scenarios for estimating site risks (USEPA 1997).
- Although no "threshold level" of risk has been established to identify PTW, a general rule is to consider as a principal threat those source materials with toxicity and mobility characteristics that combine to pose a potential risk several orders of magnitude greater than the risk level that is acceptable for the current or reasonably anticipated future land use, given realistic exposure scenarios (USEPA 1997). Materials posing potential cancer risks (as defined by USEPA) substantially greater than at least 10^{-3} may be considered for treatment as PTW, but only if such materials cannot be reliably contained (USEPA 1991, USEPA 2012).

Higher concentration materials in the Study Area are limited to waste in certain areas of the Impoundments on the north and south side of I-10[1]. The concentrations of dioxins and furans, expressed on a 2,3,7,8-tetrachlorinated dibenzo-p-dioxin (TCDD) toxicity equivalent (TEQ) basis, in sediments and soils in the Study Area range from background levels to as high as 31,600 ng TEQ/kg in the Impoundments north of I-10, and up to 50,100 ng TEQ/kg in the Impoundment south of I-10. TEQ concentrations of dioxins and furans within the Study Area but outside of the location of the Impoundments are significantly lower and do not exceed draft protective concentrations levels based on reasonable maximum exposure (RME) scenarios for potential commercial or recreational visitors (Integral and Anchor QEA 2012).

Wastes in the northern Impoundments have been reliably contained since the completion of the Time Critical Removal Action (TCRA) in July 2011. Wastes within the southern Impoundment are buried beneath several feet of soil and fill material and are also reliably contained. The presence of non-aqueous phase liquids (NAPLs) may be viewed as source

[1] The specific location and boundaries of the Impoundment located south of I-10 are addressed in Section 6.1.1.1 of the December 2012 Draft Remedial Investigation Report for the SJRWP, which is currently being revised in response to USEPA comments.

materials and classified as PTW (USEPA 1991); however, there is no known presence of NAPLs within the Study Area associated with wastes in the impoundments.

THRESHOLD CONCENTRATION LIMITS

Because USEPA does not provide a definition of PTW in terms of specific concentrations of TEQ, this section presents two candidate approaches for establishing PTW concentration thresholds using the USEPA guidance summarized above, as well as methods, toxicity criteria (TC) and assumptions consistent with the Baseline Human Health Risk Assessment (BHHRA) (Integral 2012), performed in conjunction with the Remedial Investigation/Feasibility Study (RI/FS) for the Study Area (Integral and Anchor QEA 2012). The two approaches provide cancer and non-cancer hazard estimates for the identification of PTW. This section also identifies TEQ concentrations in sediment and/or soil in the Impoundments and the Study Area for wastes that may be considered PTW, and the supporting rationale for those threshold concentrations.

Source materials in the Study Area are defined as the paper mill wastes deposited in the Impoundments, and the primary chemicals of concern are dioxins and furans. Dioxins and furans are known to be extremely non-soluble because of the high molecular weight and low solubility of those compounds, and the measured permeabilities of the paper mill wastes in the northern Impoundment were 10^{-6} cm/sec or less (Integral and Anchor QEA 2012). The reasonably anticipated future land use for the Impoundments is industrial/commercial (Miller, G. 2013, Pers. Comm.). Since the hypothetical commercial worker was evaluated in the BHHRA (Integral 2012), the proposed TEQ concentration threshold for identification of PTW in the Study Area was derived using the same TC and assumptions used in that evaluation.

Toxicity Criteria

The USEPA approved reference dose (RfD) and the tolerable daily intake (TDI) that define the threshold daily dose protective against both cancer and non-cancer risks (as defined by USEPA) were used to derive TEQ concentrations associated with unlimited future use by a commercial worker:

- Non-cancer RfD: 0.7 pg TEQ/kg bw-day

- Cancer TDI: 2.3 pg TEQ/kg bw-day

These are the same TC values used in the approved BHHRA for the RI/FS to address non-cancer and cancer risks, respectively, associated with exposures to dioxins and furans (Integral 2012).

Exposure Assumptions and Calculation of Protective Concentration Levels

The algorithm below was used to derive the proposed threshold TEQ concentrations, and the related exposure assumptions underlying evaluation of risks to the commercial worker in the BHHRA (Integral 2012); that document presents exposure assumptions for the commercial worker in Table 6-2. The rationale supporting each assumption is presented in Section 4.2.2.3 of the approved Exposure Assessment Memorandum (included as Appendix A to the BHHRA), if further clarification is needed.

A protective concentration level (PCL) for soil that addresses all pathways (e.g., incidental ingestion and dermal contact) for the commercial worker was calculated as follows:

$$PCL = \frac{1}{\frac{1}{PCL_{ing}} + \frac{1}{PCL_{dermal}}}$$

where:

$$PCL_{ing}\left(^{ng}/_{kg}\right) = \frac{TH \times AT \times BW}{ED \times EF \times FI \times IR_s \times RBA_s \times \frac{1}{RfD\ or\ TDI} \times CF1 \times CF2}$$

where:

TH = Target Hazard Index (unitless)

AT = Averaging time (days)[1]

BW = Body weight (kg)

ED = Exposure duration (years)

[1] For noncarcinogenic and threshold carcinogenic endpoints, AT equals the exposure duration in years multiplied by 365 days/year.

EF = Exposure frequency (days/year)

FI = Fraction of total intake that is related to the Study Area (unitless)

IR_s = Ingestion rate for soil (mg/day)

RBA_s = Relative bioavailability adjustment factor (unitless)

RfD = Reference dose (pg/kg-day)

TDI = Tolerable daily intake (pg/kg-day)

CF1 = Conversion factor 1 (0.000001 kg/mg)

CF2 = Conversion factor 2 (1000 pg/ng)

And:

$$PCL_{dermal}\left({}^{ng}/_{kg}\right) = \frac{TH \times AT \times BW}{ED \times EF \times FI \times AF \times SA \times ABS_d \times \frac{1}{RfD\ or\ TDI} \times EV \times CF1 \times CF2}$$

where:

TH = Target Hazard Index (unitless)

AT = Averaging time (days) [2]

BW = Body weight (kg)

ED = Exposure duration (years)

EF = Exposure frequency (days/year)

FI = Fraction of total intake that is related to the Study Area (unitless)

AF = Dermal adherence factor (mg/cm2)

SA = Skin surface area exposed (cm2)

ABS_d = Dermal absorption factor for soil and sediment (unitless)

RfD = Reference dose (pg/kg-day)

TDI = Tolerable daily intake (pg/kg-day)

EV = Event frequency (1/day)

CF1 = Conversion factor 1 (0.000001 kg/mg)

CF2 = Conversion factor 2 (1000 pg/ng)

[2] For noncarcinogenic and threshold carcinogenic endpoints, AT equals the exposure duration in years multiplied by 365 days/year.

Values for exposure assumptions for the hypothetical RME commercial worker (presented in Table 6-2 of the BHHRA) are as follows:

TH = 1
AT = 9,125 days
BW = 80 kg
ED = 25 years
EF = 225 days/year
FI = 1
IR_s = 100 mg/day
RBA_s = 0.5
AF = 0.2 mg/cm^2
SA = 3,470 cm^2
ABSd = 0.03
EV = 1/day
CF1 = 1 x 10^{-6} kg/mg
CF2 = 1 x 10^3 pg/ng
RfD = 0.7 pg TEQ/kg bw-day
TDI = 2.3 pg TEQ/kg bw-day

These are the same assumptions used in the BHHRA.

Cancer and Non-Cancer PCLs

Using the algorithms, exposure assumptions and TC presented above, the following soil PCLs were calculated:

- Non-cancer PCL for a hypothetical future outdoor commercial worker: 1,300 ng TEQ/kg dw
- Cancer PCL for a hypothetical future outdoor commercial worker: 4,200 ng TEQ/kg dw

These are the protective concentrations associated with unrestricted use by an outdoor commercial worker.

Threshold TEQ Concentration Limits for Principal Threat Waste

Following USEPA guidance and the analysis presented above, a concentration threshold was calculated that is two orders of magnitude greater than the protective level for unrestricted use at the Site under the hypothetical future commercial worker exposure scenario. The recommended concentration threshold for the designation of PTW associated with dioxin and furan contaminated waste is 130,000 ng TEQ/kg (based on more restrictive non-cancer PCL presented above).

Consistent with USEPA guidance, sediment and soil materials that are highly toxic and/or highly mobile, and cannot be reliably contained may be considered for designation of PTW. As discussed above, maximum TEQ levels at the Site are 50,100 ng TEQ/kg, well below the calculated PTW concentration threshold of 130,000 ng TEQ/kg. Based on extensive sampling of the waste in the Impoundments and the Study Area, no such concentrations of dioxins/furans exist in the Study Area.

CONCLUSION

Sediments and soils in the Impoundments containing elevated dioxin/furan concentrations can be reliably contained, are not associated with any non-aqueous phase liquids that present significant mobility concerns, and do not exhibit high degrees of toxicity compared to potential PTW concentration thresholds. Based on the above evaluation and the reasonably anticipated future land use for the area surrounding the Impoundments, the Study Area does not contain any source materials that should be considered or treated as PTW. This conclusion is consistent with USEPA's determination of dioxin/furan contaminated materials at other similar sites (e.g., Tittabawasee River, Michigan). That system contains flood plain soils and sediment with concentrations higher than those observed within the SJWRP Study Area; however, those materials are being actively addressed in a series of removal actions without PTW classification.

We appreciate your consideration and look forward to your feedback on this issue. At this time, the Respondents recommend that we proceed with the development of remedial alternatives in the FS using USEPA guidance, and without specific consideration of PTW. Please do not hesitate to contact me if you would like to discuss this issue any further.

Sincerely,

David C. Keith
Project Coordinator
Anchor QEA, LLC

Cc: Phil Slowiak, International Paper Company
Dave Moreira, McGinnes Industrial Maintenance Corporation
Jennifer Sampson, Integral Consulting Incorporated

REFERENCES

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